Productivity Comparison Macintosh vs. Windows

Analysis of a study by
Arthur D. Little, Inc.
January 1994

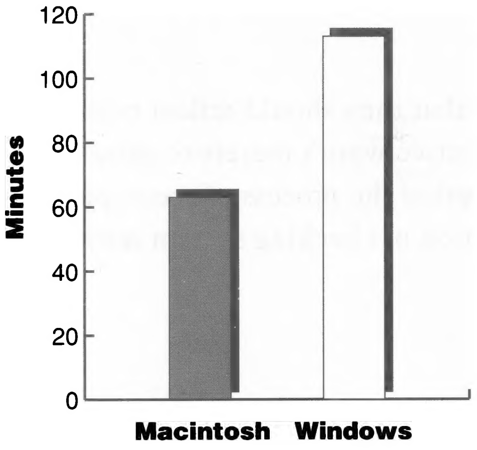
SUMMARY

This report summarizes the results of a productivity study, *A Comparative Study of Productivity: Macintosh vs. Windows,* completed in January 1994 by Arthur D. Little, Inc., a leading international consulting firm. The study compared the productivity of people using Apple Macintosh computers to that of people using Intel-based personal computers running Microsoft Windows.

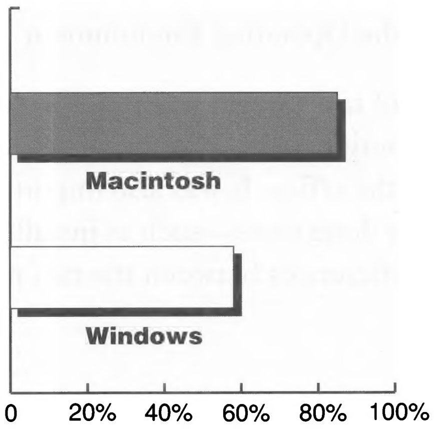
Macintosh exhibited a significant advantage over Windows. The study's overall finding is that "*...today's Macintosh represents a fundamentally more productive platform/environment than does a comparable Windows machine for a broad range of typical business computing activities.*" Arthur D. Little tested Macintosh and Windows users of comparable skill levels working on an identical set of business computing tasks. Productivity was defined along two dimensions: completion time, how long it took to complete the tasks; and effectiveness, whether the tasks were completed correctly. The key findings from the study are as follows:

- **Completion time.** Macintosh users completed the tasks in an average of 63 minutes. The Windows users required 113 minutes to finish. This means that Macintosh users needed 44 percent less time than the Windows users.
- **Effectiveness.** Macintosh users weren't only faster, they were also more accurate. The average Macintosh user completed 85 percent of the tasks correctly. The average Windows user completed only 58 percent of the tasks correctly. Overall, Macintosh users completed 43 percent more of the tasks correctly than did Windows users.

Completion time



Effectiveness



Inherent productivity advantages. The study clearly shows that the Macintosh has inherent productivity advantages over Windows. For the range of tasks tested, users on the Macintosh platform consistently outperformed users on Windows, in terms of both completion time and effectiveness. This performance edge was true not only for the test as a whole, but also for every component/segment of the test.

OBJECTIVE AND METHODOLOGY

The objective of this study was to compare the productivity of people using Apple Macintosh computers to that of people using Intel-based personal computers running Microsoft Windows, across a variety of business computing tasks. The test was designed to keep the research focused, at the purest level possible, on the fundamental productivity differences between the two environments.

The test included 24 tasks, which were further grouped into 11 major categories. The completion time scores and the effectiveness scores were based on these 11 categories:

- Managing Files
- Checking System Resources
- Printing Across the Network
- Editing a Compound Document
- Exchanging Files on the Network
- Installing an Application
- Installing a Peripheral
- Checking for an Application
- Sharing Files
- Recovering Files
- Installing the Operating Environment

The majority of tasks were developed with the criterion that they should reflect typical business computing tasks. However, the overall test objective wasn't merely to simulate a typical day in the office. It was also important to test whether the process of accomplishing less frequently done tasks—such as installing an application or checking system resources—showed any differences between the two platforms.

The test environments for both groups were designed to be equivalent to every extent possible. The computers used were comparably equipped Intel-based PCs running MS-DOS 5.0 and Microsoft Windows 3.1 and Macintosh systems running System 7.1. Each computer was connected to a local-area network with the most common network software found in today's business environment, and equipped with the same mainstream word processing and spreadsheet applications. Network servers were similarly matched, and printing resources were identical on each side.

Macintosh and Windows users were tested in separate rooms and were not aware that the goal of the test was to compare productivity differences between the two platforms. Participants on both sides were given the same time limits and tasks to complete.

OVERALL RESULTS

Completion time. Study participants were timed to see how long it took them to complete each task grouping. The overall findings for completion time show that Windows users took significantly more time to finish their tasks than the Macintosh users. Macintosh users consistently outpaced their Windows peers on each of the 11 task groupings, demonstrating a greater than 50 percent speed advantage in 5 of these 11.

Macintosh users spent 44 percent less time than Windows users

Task Grouping	**Macintosh Users (minutes)**	**Windows Users (minutes)**	**Macintosh Advantage***
Managing Files	6.5	20.3	68%
Checking System Resources	4.5	11.3	60%
Printing Across the Network	3.2	7.5	57%
Recovering Files	2.0	4.6	57%
Exchanging Files on the Network	3.8	7.9	52%
Installing an Application	8.7	15.3	43%
Checking for an Application	4.0	6.4	38%
Sharing Files	6.2	9.8	37%
Editing a Compound Document	6.3	9.4	33%
Installing the Operating Environment	8.0	10.0	20%
Installing Peripherals**	9.5	10.8	12%
Total	62.7	113.3	44%

** Indicates how much less time (on a percentage basis) it took Macintosh users to complete each grouping of tasks than it took Windows users to complete the same tasks.*
***In "Installing Peripherals," Windows users were not required to open their computer to install any interface cards.*

Effectiveness. The tasks that study participants completed were also measured for accuracy. Under real job conditions, incorrectly completed work must be redone, which significantly affects productivity.

Overall, for the 11 categories completed, Macintosh users significantly outperformed Windows users in terms of effectiveness. In addition, Macintosh users outperformed Windows users for each of the 24 individual tasks.

Macintosh users completed 43 percent more tasks correctly

Task Grouping	**Number of Tasks**	**Macintosh Users**	**Windows Users**	**Macintosh Advantage***
Recovering Files	1	0.5	0.1	400%
Printing Across the Network	2	1.8	0.6	200%
Editing a Compound Document	2	1.4	0.5	180%
Installing Peripherals**	1	0.8	0.5	60%
Installing an Application	1	0.9	0.6	52%
Managing Files	5	4.8	3.5	37%
Checking System Resources	3	2.7	2.0	35%
Installing the Operating Environment	1	0.9	0.7	29%
Sharing Files	2	1.5	1.2	25%
Checking for an Application	2	1.6	1.3	23%
Exchanging Files on the Network	4	3.6	3.3	9%
Total	24	20.5	14.3	43%

** Indicates for each grouping, how many more tasks (on a percentage basis) were completed correctly by the Macintosh users than by the Windows users.*

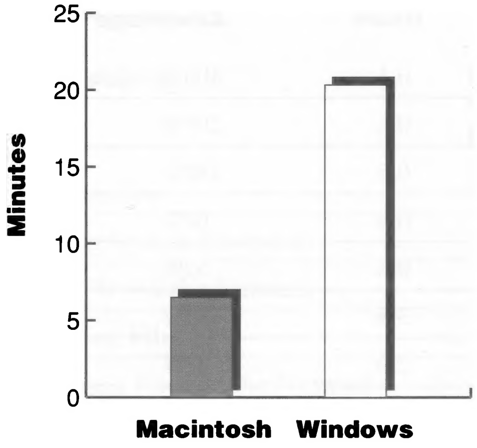
***In "Installing Peripherals," Windows users were not required to open their computer to install any interface cards.*

SPECIFIC FINDINGS

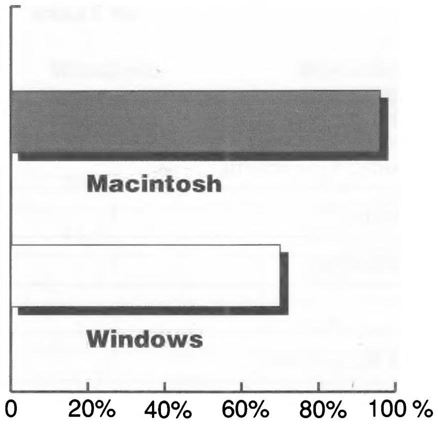
Managing Files

Users were asked to perform a number of basic file management tasks, such as creating a new folder/directory, locating a file, copying files, duplicating and renaming files, and deleting files.

Macintosh users spent 68 percent less time than Windows users



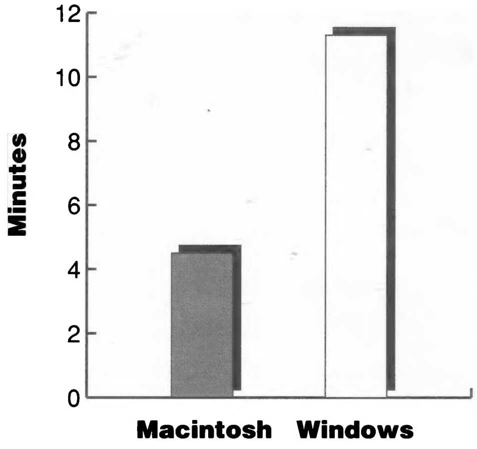
Macintosh users completed 96 percent of tasks correctly vs. 70 percent for Windows users



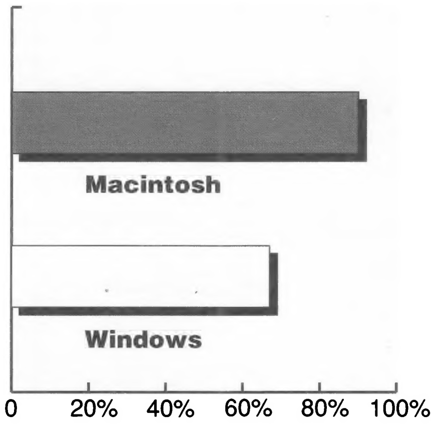
Checking System Resources

Users were asked to move an application from one hard disk drive to another to free up disk space, check available space on their hard disk drive, and check the amount of RAM installed in their computer.

Macintosh users spent 60 percent less time than Windows users



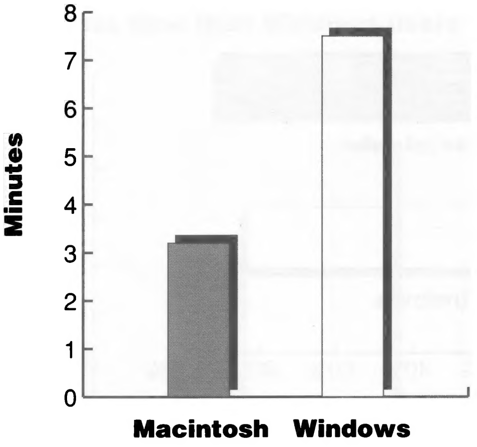
Macintosh users completed 90 percent of tasks correctly vs. 67 percent for Windows users



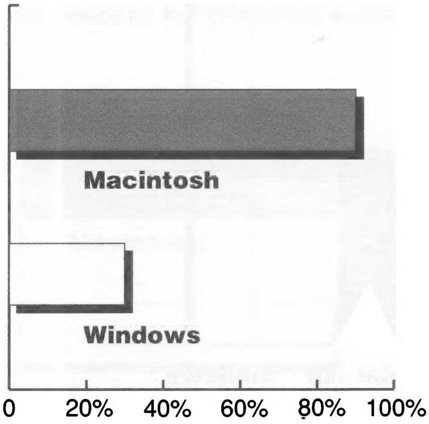
Printing Across the Network

Users were asked to select two different network printers and to print a document on each of these two printers.

Macintosh users spent 57 percent less time than Windows users



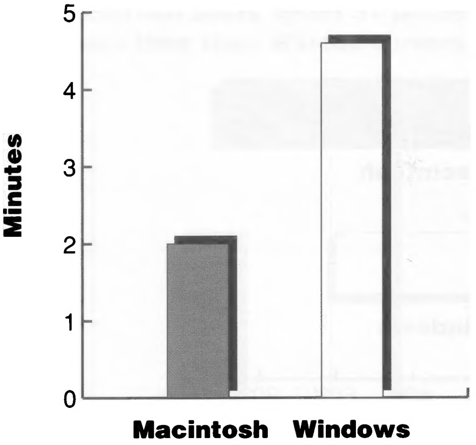
Macintosh users completed 90 percent of tasks correctly vs. 30 percent for Windows users



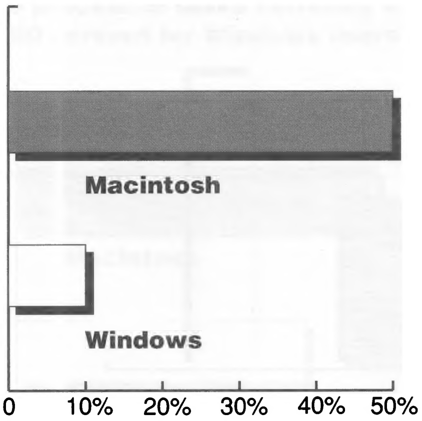
Recovering Files

Users were asked to recover a file that they had been asked to delete earlier in the test.

Macintosh users spent 57 percent less time than Windows users

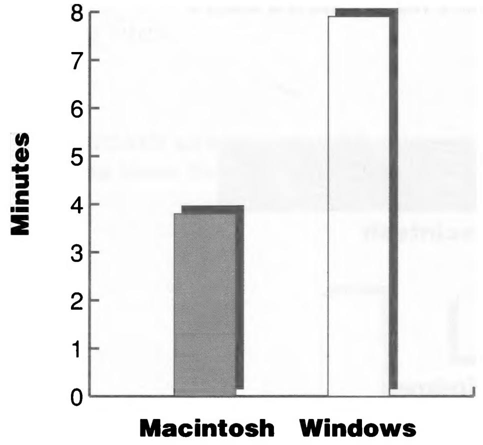


Macintosh users completed 50 percent of tasks correctly vs. 10 percent for Windows users

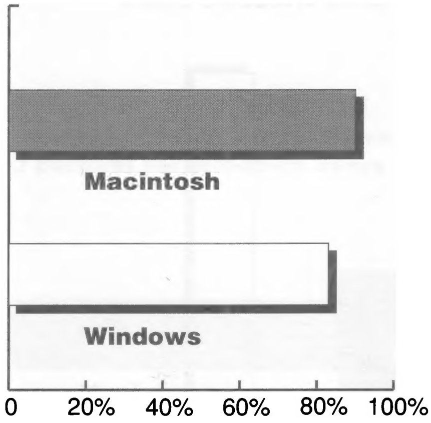


Exchanging Files on the Network

Users were asked to retrieve files from the server and to back up files onto the server.



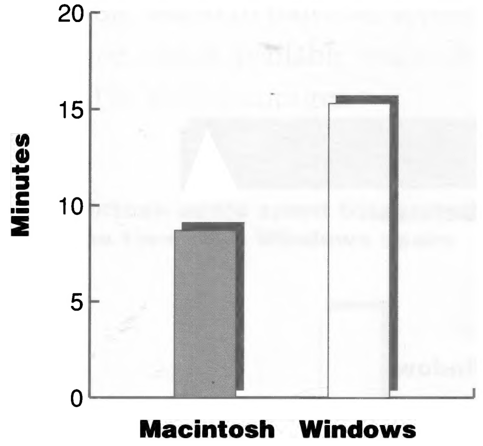
Macintosh users spent 52 percent less time than Windows users



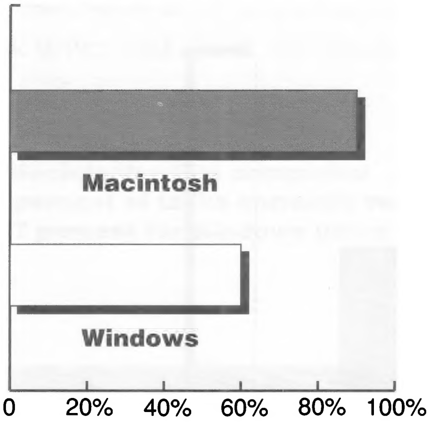
Macintosh users completed 90 percent of tasks correctly vs. 83 percent for Windows users

Installing an Application

Users were asked to install a leading word processing application.



Macintosh users spent 43 percent less time than Windows users

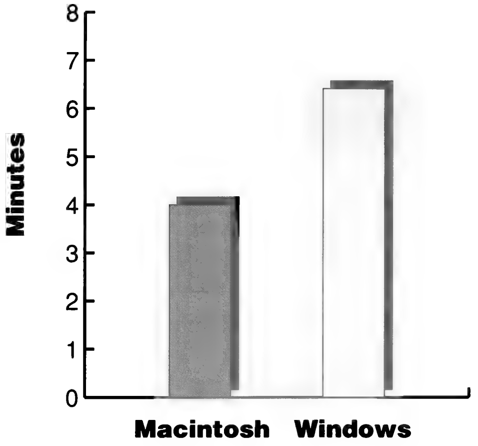


Macintosh users completed 90 percent of tasks correctly vs. 60 percent for Windows users

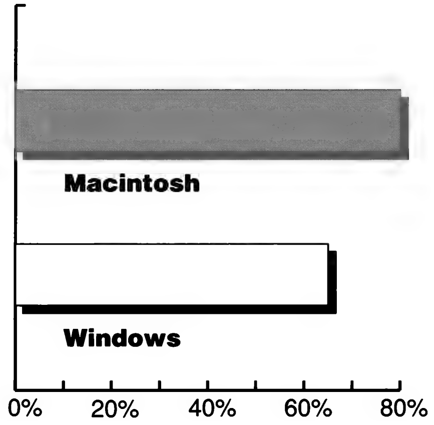
Checking for an Application and Fonts

Users were asked to determine whether an application was installed and, if it was, to write down the version number. They were also asked to determine whether certain fonts were loaded and, if they weren't, to load them.

Macintosh users spent 38 percent less time than Windows users



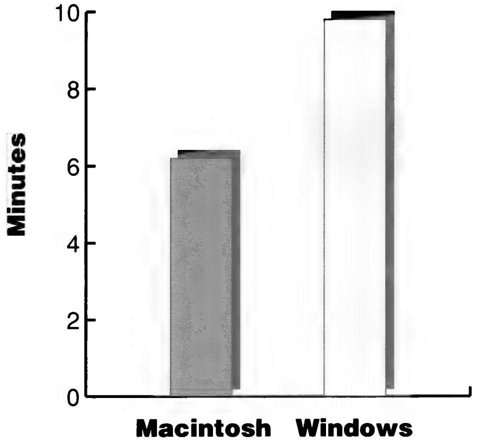
Macintosh users completed 80 percent of tasks correctly vs. 65 percent for Windows users



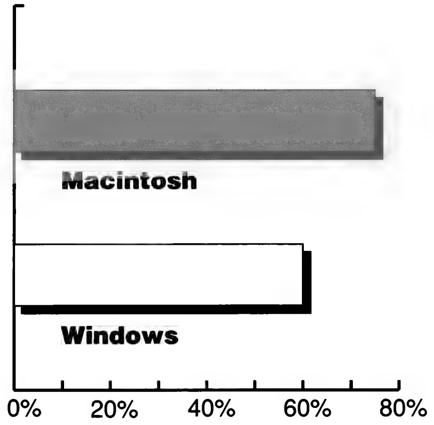
Sharing Files

Users were asked to retrieve files from a coworker's computer and from a server.

Macintosh users spent 37 percent less time than Windows users



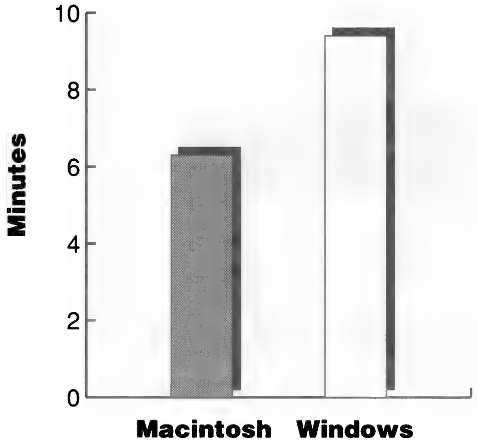
Macintosh users completed 75 percent of tasks correctly vs. 60 percent for Windows users



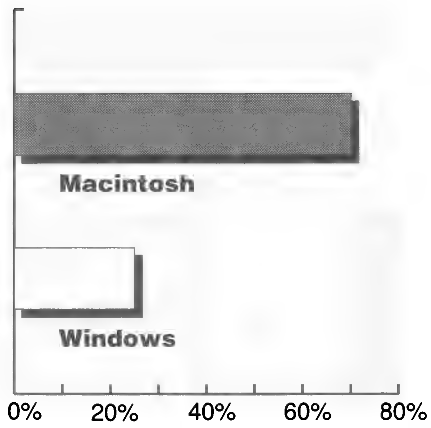
Editing a Compound Document

Users were asked to locate an existing document, remove a graphic and chart, and replace them with a different graphic and chart. The graphic was located on the server and the chart was stored locally on the computer.

Macintosh users spent 33 percent less time than Windows users



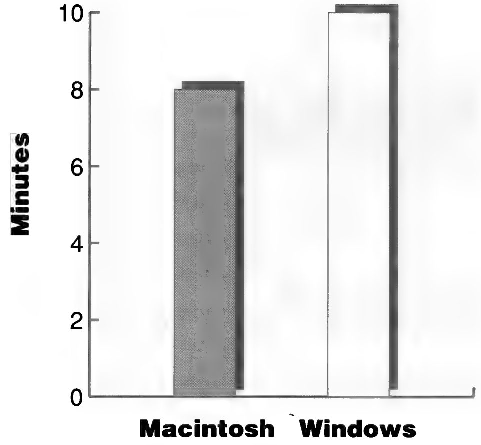
Macintosh users completed 70 percent of tasks correctly vs. 25 percent for Windows users



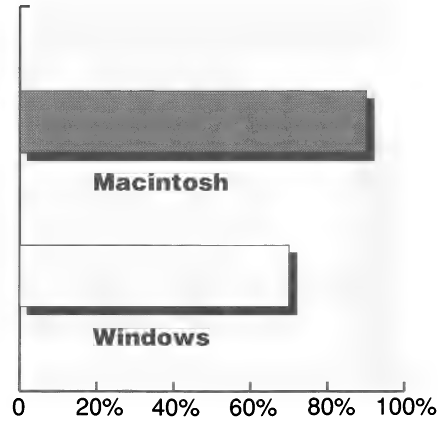
Installing the Operating Environment

Users were asked to install the operating environment on their computer (Windows 3.1 on the PC and System 7.1 on the Macintosh).

Macintosh users spent 20 percent less time than Windows users



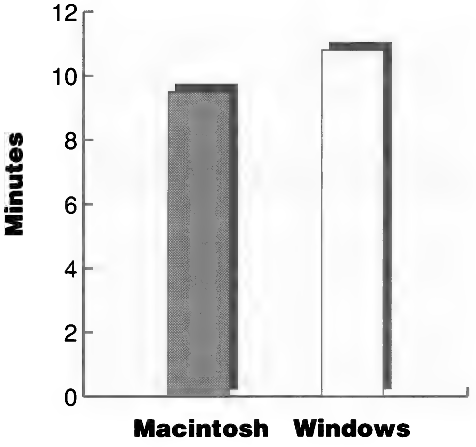
Macintosh users completed 90 percent of tasks correctly vs. 70 percent for Windows users



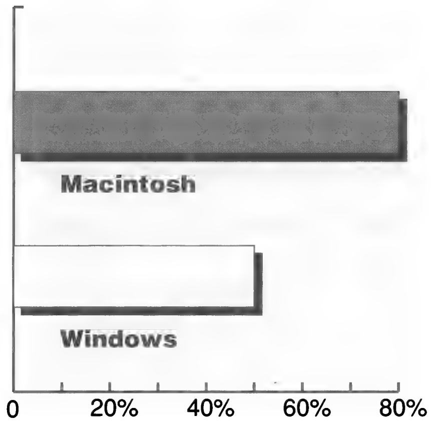
Installing Peripherals

Users were asked to attach a CD-ROM drive to their computer and install the accompanying software. (The PCs had the CD-ROM interface card preinstalled, so this portion of a typical PC peripheral installation was completed for the users.)

Macintosh users spent 12 percent less time than Windows users



Macintosh users completed 80 percent of tasks correctly vs. 50 percent for Windows users



FOCUS GROUP RESULTS

In addition to the quantitative findings from the tests, participants in the study were also asked for qualitative information about their experiences with the Macintosh or Windows platform. Findings showed an overall contrast between how Macintosh and Windows participants characterized their feelings about the test. Windows users showed higher levels of frustration and reported some trouble with the time limits associated with the tasks. Macintosh users generally completed the tasks within the time limits and without frustration.

When participants were asked about platform preferences, here is what some of them said:

Windows Participants (some with Macintosh experience)

> *"I've had Windows for four years, and I still have a lot of trouble. I am not a stupid person, and I don't feel comfortable with it still after four years."*
>
> *"I'm now a Windows user because the firm I work for has Windows, and I don't have a choice. It's a lot better than DOS, I wouldn't even take a job (if it were DOS), they would have to double my salary. But to compare it to a Mac? I would always rather have a Mac, always..To me, Windows compared to Mac, Mac's a little slower, but to me Windows is cumbersome."*
>
> *"Mac is totally better."*
>
> *"I can say I'm more comfortable with the Macintosh and I feel more efficient because of all of the many different things you can do on the Mac vs. IBM, and because I'm more comfortable with it."*
>
> *"There's something about the aesthetics on the Mac, because I use them both a lot, and I remember what it was like to try and remember some of the DOS-based or Windows-based programs from Microsoft when I first started and what it was like when you first see a Mac... There's something that's kind of indescribable about the way a Mac drives you to want to use a Mac."*

Macintosh Participants (some with Windows experience)

> *"I said the Mac was better because it was a more visually oriented platform...For some reason, with Windows— the way the letters are, the way everything looks,—it's just not as aesthetic. It looks like it's not as clean to interpret and understand and see files. That's my own personal bias. I'm more Mac."*
>
> *"I never had to use DOS ever. So when I started working I was in Windows, a new Windows environment. I'm also at the top of the line PC equipment...I still like my Mac better."*
>
> *"The PCs are faster, but when it comes to getting work done during the day, a Mac's more productive."*
>
> *"The Macs are so easy and it's so simple to do something that you don't think you know how to do. That increases your productivity because you don't have to run around asking lots of questions—you can just get more work done."*

CONCLUSIONS

The study concludes that the Macintosh platform offers inherent productivity advantages over the Windows platform. Arthur D. Little found this to be true for common day-to-day tasks as well as for less frequently done tasks.

- The Macintosh computer provides a more productive environment, both for accomplishing common day-to-day tasks and for accomplishing tasks that are done less frequently, than an Intel-based personal computer running Windows.
- For the range of tasks tested, users on the Macintosh platform consistently outperformed users on Windows, in terms of both completion time and effectiveness. This performance edge was true not only for the test as a whole but for every part of the test.
- Although some participants believed that Windows had an advantage in a few areas such as processor speed, there were no productivity results that showed that these perceived Windows advantages had any bearing on productivity.

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